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Anophthalmic Trechines (Coleoptera, Trechinae) from Shagataté-yama in the Northwestern Part of Mino Province, Central Japan

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Abstract Three anophthalmic trechine beetles found on Shagataté-yama lying on a southward branch of the Ryôhaku Mountains in the northwestern part of Mino Province, Central Japan, are dealt with. Two of them are endogean, coexisting in fissures of shale in beech forests, and are named *Suzuka morii* and *Kurasawatrechus yadai*. The other one is upper hypogean, mainly living in the upper hypogean zone near narrow streams, and is identified with *Trechiama gracilior* S. UÉNO, previously known from only the Midori-dani in Neo of Motosu-shi.

In the autumn of 2002, Hideo YADA came across an endogean species of *Kurasawatrechus* in a gully near the Umasaka-tôgé lying on the northern ridge of Shagataté-yama, which stands on the Ibi Hills, a southward branch of the Ryôhaku Mountains in the northwestern part of Mino Province, Central Japan. Guided by him, Masato MORI visited the mountain early in the summer of 2003 and succeeded in taking a series of specimens of the *Kurasawatrechus*, among which was found a specimen of another anophthalmic trechine beetle apparently belonging to the genus *Suzuka*. This discovery was most unexpected, since the latter genus was theretofore represented by only two species, *S. kobayashii* (S. UÉNO) (1956, p. 75, figs. 3–4) and *S. masuzoi* S. UÉNO (1989, p. 16, figs. 1–3).

After that, the mountain was investigated by the members of the Kansai Trechine Research Group, by MORI, YADA and KITAYAMA in the autumn of 2003, and by the same members and Shotaro TANAKA late in the autumn of the same year, but no additional specimens of *Suzuka* were met with. In the spring of 2004, however, a new habitat of the trechine beetle under consideration was located by the same members and Takumi SAITÔ after three trips to the second collecting site. About one month later, Yoshiaki NISHIKAWA and UÉNO paid a visit to the montain, but were unable to find any specimen of *Suzuka*. Then in the spring of this year, we had another opportunity to visit the same mountain together with MORI, YADA, TANAKA and Hisashi ASHIDA, and made careful observation of the habitats of the anophthalmic trechines then known, which included *Suzuka*, *Kurasawatrechus* and *Trechiama*, the last one being found in a habitat somewhat different from that of the other two.

After a careful study, it became evident that the *Suzuka* and *Kurasawatrechus* were new to science, and are described in the present paper under the names *S. morii* and *K. yadai*. The *Trechiama* was identified with *T. gracilior* S. UÉNO (1980, pp. 202, 241, figs. 46–48) theretofore known only from the Midori-dani in Neo of Motosu-shi, and is newly recorded from Shagataté-yama. The abbreviations used in the present paper are the same as those explained in previous papers of UÉNO's.

Before going into further details, we wish to express our deep indebtedness to Dr. Hisashi ASHIDA, Dr. Yoshiaki NISHIKAWA, Messrs. Masato MORI, Takao NAITÔ, Takumi SAITÔ, Shotaro TANAKA and Hideo YADA for their kind support of the present study. Special thanks are due to Mr. MORI for his kindness in giving us detailed information about the discovery of the new *Suzuka*.

Suzuka morii S. UÉNO et K. KITAYAMA, sp. nov.

(Figs. 1–3)

Length: 3.10–3.45 mm (from apical margin of clypeus to apices of elytra).

Closely similar to *S. masuzoi* S. UÉNO (1989, p. 16, figs. 1–3) in external morphology, but distinguished at first sight by its broader elytra with longer basal parts and more oblique prehumeral borders. Markedly different from *S. masuzoi* also in the configuration of aedeagus, with large basal part, regularly arcuate middle part, straightly produced apical lobe subtruncated at the apex, and differently shaped inner armature.

Colour as in *S. masuzoi*, very shiny. Microsculpture as in *S. masuzoi*, almost completely vanished on pronotum and elytra. Head similar to that of *S. masuzoi*, but the genae are less convex at the posterior parts and the frons is only vaguely carinate on the median line; antennae reaching basal two-sevenths of elytra in ♂, more or less shorter than that in ♀. Pronotum also similar to that of *S. masuzoi* though the basal part is somewhat longer, widest at about five-sixths from base, with the sides widely and rather shallowly sinuate at about basal sixth to fifth; PW/HW 1.33–1.42 (M 1.38), PW/PL 0.93–0.99 (M 0.96), PW/PA 1.20–1.26 (M 1.23), PW/PB 1.62–1.68 (M 1.65), PA/PB 1.30–1.40 (M 1.34).

Elytra obviously broader and more regularly convex than in *S. masuzoi*, widest at about middle, and equally narrowed towards bases and apices, with longer basal parts more gradually narrowed towards basal peduncle; EW/PW 1.67–1.74 (M 1.70), EL/PL 2.24–2.42 (M 2.31), EL/EW 1.36–1.46 (M 1.41); shoulders effaced; prehumeral borders oblique, slightly outcurved, becoming obsolete anteriad before reaching basal peduncle; sides narrowly bordered throughout, rather strongly arcuate, and conjointly

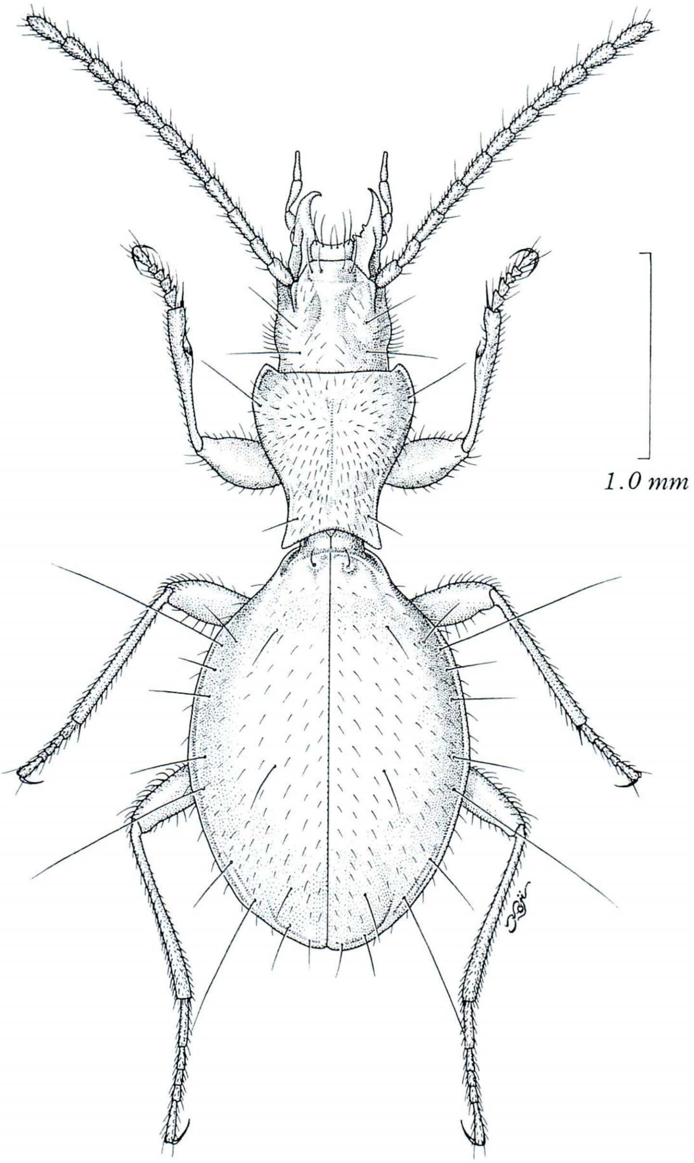
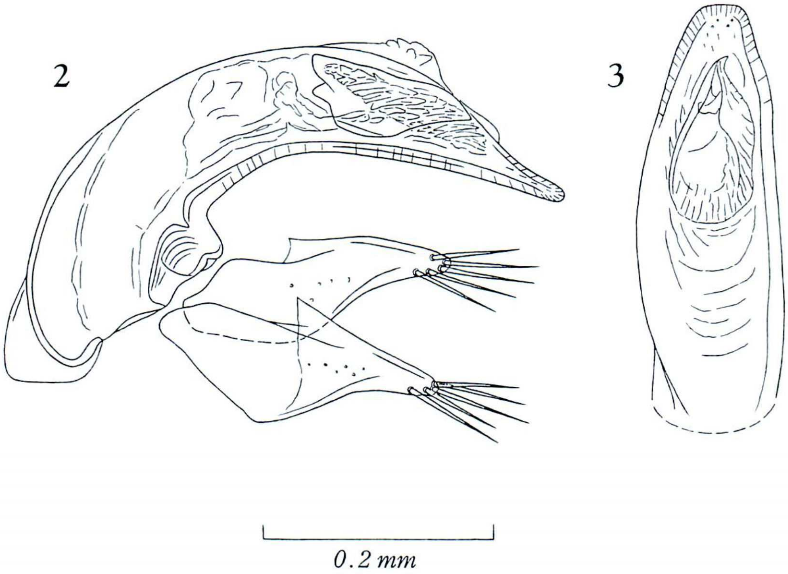


Fig. 1. *Suzuka morii* S. UÉNO et K. KITAYAMA, sp. nov., ♂, from Shagataté-yama on the Ibi Hills.

rounded at apices; dorsum convex, rather gently declivous at the apical parts; striae obsolete altogether, though vague trace of several striae is sometimes peceptible in apical parts; apical strioles distinct though short, anteriorly divergent, and free at the anterior ends; two setiferous dorsal pores present on the site of stria 3, at 1/6–1/5 and 1/2–3/5 from base, respectively; preapical pore and marginal umbilicate pores as in *S. masuzoi*.



Figs. 2–3. Male genitalia of *Suzuka morii* S. UÉNO et K. KITAYAMA, sp. nov., from Shagatatė-yama on the Ibi Hills; left lateral view (2), and apical part of aedeagus, dorso-apical view (3).

Ventral surface and legs as in *S. masuzoi*.

Male genital organ very small though moderatelyy sclerotized. Aedeagus only one-fourth as long as elytra, moderately arcuate from the proximal end to the base of apical lobe, and lightly depressed except for basal part, which is very large, with small basal orifice whose sides are only slightly emarginate; sagittal aileron fairly large, subtriangular and hyaline; viewed laterally, aedeagus gradually tapered towards apical lobe, which is narrow, rod-like, and blunt at the extremity; viewed dorsally, apical part broad, very gradually narrowed apicad, and subtruncated at the tip; in profile, ventral margin rather deeply emarginate at about middle, but nearly straight behind there. Inner sac armed with a fairly large copulatory piece about three-tenths as long as aedeagus, which is somewhat spatulate at the proximal part but acuminate at the apex whose acute tip is curved to the left; an elogate, well sclerotized and compact teeth-patch present on the left side of copulatory piece, largely consisting of spinulous teeth but partially of scale-like ones. Styles fairly large and broad, left style a little longer than the right and devoid of ventral apophysis; apical parts short and attenuate, each usually bearing five short setae at the apex.

Type series. Holotype: ♂, allotype: ♀, (Neo side), 23–IV–2005, H. ASHIDA leg. Paratypes: 1♂, (Tokuyama side), 14–VI–2003, M. MORI leg.; 1♂ (Tokuyama side), 17–IV–2004, K. KITAYAMA leg.; 2♂♂, (Neo side), 29–IV–2004, M. MORI leg.; 2♀♀, (Neo side), 23–IV–2005, S. UÉNO & K. KITAYAMA leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Type locality. Shagataté-yama on the Ibi Hills, on the borders of Tokuyama (in Ibigawa-chô) and Neo (in Motosu-shi), 510 m (Tokuyama side) and 660 m (Neo side) in altitude, Gifu Prefecture, Central Japan.

Notes. The present new species is no doubt closer to *S. masuzoi* than to *S. kobayashii*, as is clearly shown by the peculiarities of both the external and genitalic morphology. This may not be due to the difference in the distance from Shagataté-yama to the type localities of the two species, about 43 km to the north by east in a beeline to that of *S. masuzoi* and about 54 km to the south-southwest in a beeline to that of *S. kobayashii*. The closer affinity of *S. morii* to *S. masuzoi* must have resulted from the paleogeographical and topographical proximity of their habitats. All the known members of the genus *Suzuka* are restricted to the sigmoidal chain of non-volcanic (except for the northernmost part) mountains extending across central Honshu of Japan, which consists of the Ryôhakus, Etsumis, Ibukis and Suzukas, the last one of which was separated from the others by Lake Kobiwa-ko in the past and is isolated to some extent even at the present. On the other hand, the known localities of *S. morii* and *S. masuzoi* are located on different branches of the Ryôhaku Mountains, though the actual distance between them is rather long when measured along the meandering watershed ridge. It is therefore not surprising that *S. kobayashii* of the northern Suzukas differs from the two Ryôhaku species at the species-group level, since its speciation must have taken place well before that of the latter two.

Suzuka morii has so far been known from two stations on Shagataté-yama at either side of the Umasaka-tôgé. First found was a fairly large scree on the left side of a branch gully of the Koi-dani Valley at the western side of the watershed ridge. However, *Suzuka* was extremely rare at this place, only a very few specimens having been dug out mingled with *Kurasawatrechus yadai* to be described on later pages. The second station was located at the other side of the watershed, or at the eastern side of Shagataté-yama, about 1 km south-southeast of the first one. It was a steeply inclined fissured shale covered with soil and shaded by deciduous broadleaved trees. It was exposed at the side of an old forestry road and was distant from streams, though fed by trickles here and there. The trechines dwelt on the surface of platy shale several layers below the surface, often on vertical ones. Here again, *Suzuka* was much rarer than *Kurasawatrechus*, though they were found in coexistence exactly on the same plates.

It gives us a great pleasure to dedicate this interesting and important species to Mr. Masato MORI, without whose enthusiasm this trechine could never have been brought to light.

Kurasawatrechus yadai S. UÉNO et K. KITAYAMA, sp. nov.

(Figs. 4–6)

Length: 2.75–3.40 mm (from apical margin of clypeus to apices of elytra).

Closely allied to *K. spelaeus* S. UÉNO (1958, p. 129, 1974, p. 202, figs. 6–7) and not distinguishable with confidence on external morphology alone, but the male geni-

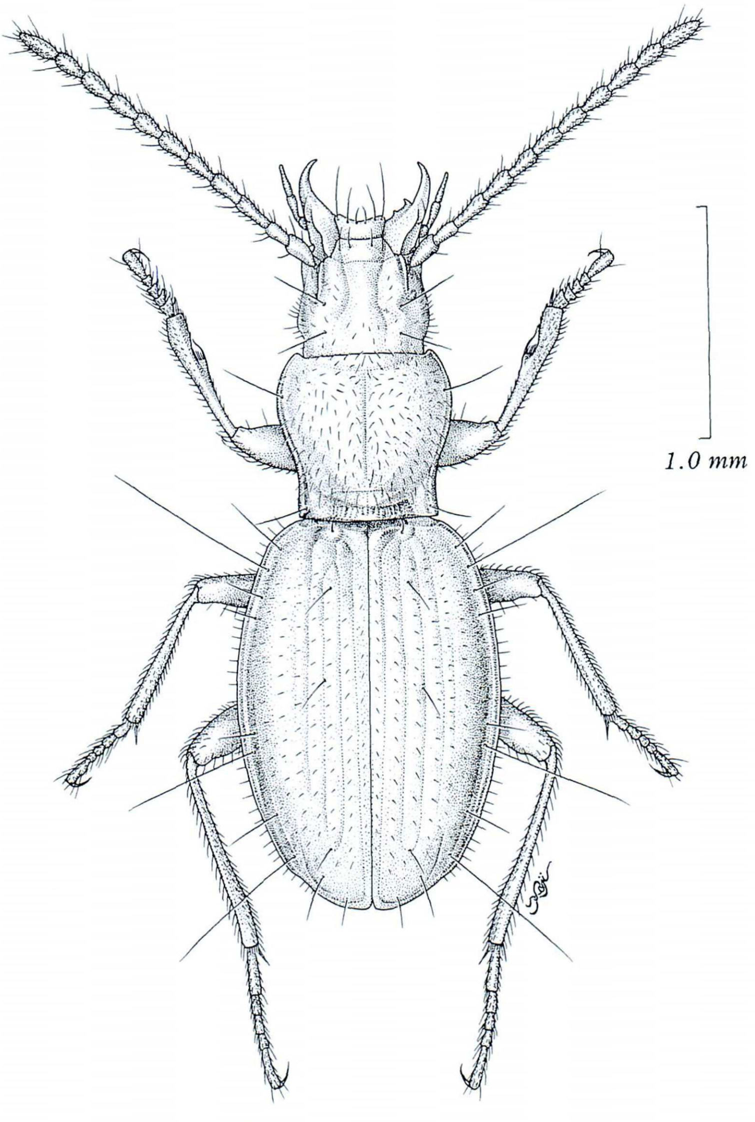
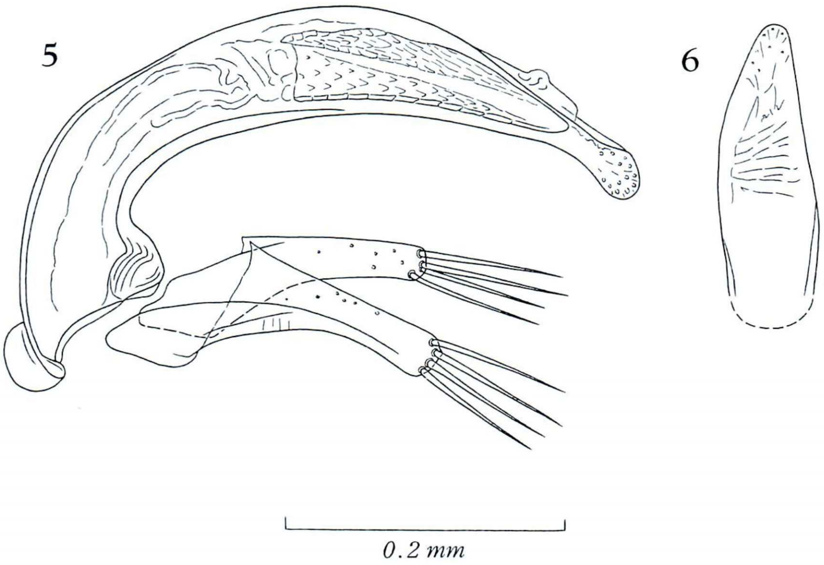


Fig. 4. *Kurasawatrechus yadai* S. UÉNO et K. KITAYAMA, sp. nov., ♂, from Shagataté-yama on the Ibi Hills.

talia differ strikingly from those of the latter species, particularly in much slenderer aedeagus with differently shaped apical lobe. Standard ratios of body parts as follows: PW/HW 1.32–1.42 (M 1.37), PW/PL 1.01–1.13 (M 1.08), PW/PA 1.21–1.34 (M 1.28), PW/PB 1.21–1.31 (M 1.27), PB/PA 0.94–1.10 (M 1.02), EW/PW 1.49–1.60 (M 1.54), EL/PL 2.18–2.55 (M 1.42), EL/EW 1.40–1.51 (M 1.46).

Male genital organ very small though moderately sclerotized, much slenderer and



Figs. 5–6. Male genitalia of *Kurasawatrechus yadai* S. UÉNO et K. KITAYAMA, sp. nov., from Shagataté-yama on the Ibi Hills; left lateral view (5), and apical part of aedeagus, dorso-apical view (6).

less evenly arcuate than in *K. spelaeus*, with apical lobe more rapidly tapered in dorsal view and dilated into a rounded terminal portion in lateral view. Aedeagus about one-fourth as long as elytra, slender, and lightly arcuate, with small basal part strongly curved ventrad; basal orifice small, with the sides shallowly emarginate; sagittal aileron small and hyaline though semicircularly protrudent; viewed dorsally, apical lobe nearly symmetrical, gradually narrowed towards the tip which is narrowly rounded; viewed laterally, apical part gradually tapered, lightly curved ventrad at the base of apical lobe, and dilated into a rounded terminal portion; ventral margin widely but only slightly emarginate at middle in profile. Inner sac armed with an elongate copulatory piece nearly half as long as aedeagus, rolled towards the left side, and covered with scales of various shape particularly along the dorsal and ventral margins. Styles relatively short and narrow, ventral apophysis of left style atrophied, each bearing four long setae at the apex.

Type series. Holotype: ♂, (Neo side), 23–IV–2005, S. UÉNO leg. Allotype: ♀, (Neo side), 29–V–2004, S. UÉNO leg. Paratypes: 5♂♂, 2♀♀, (Neo side), 23–IV–2005, S. UÉNO, M. MORI & H. YADA leg.; 2♂♂, (Tokuyama side), 14–VI–2003, M. MORI leg.; 6♂♂, 4♀♀, (Tokuyama side), 17–IV–2004, K. KITAYAMA leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Type locality. Shagataté-yama on the Ibi Hills, on the borders of Tokuyama (in Ibigawa-chô) and Neo (in Motosu-shi), 510 m, 550 m (Tokuyama side) and 660–680 m (Neo side) in altitude, Gifu Pref., Central Japan.

Notes. This new species is doubtless related to *K. spelaeus* S. UÉNO so far known from only a small limestone cave called Kugô-dô, which lies in the Nagara-gawa drainage about 23 km distant in a beeline from Shagataté-yama to the east-southeast beyond the Neo-gawa Valley. All the diagnostic characters of the *spelaeus* group, *e.g.*, reduction of microsculpture on the pronotum and elytra, and loss of the pubescence on the ventrites, are also found in *K. yadai*. With the discovery of this new species, it becomes apparent now that the members of the species-group are localized in the surrounding areas of the Ryôhaku Mountains; *K. yadai* and *K. glabriventris* (UÉNO, 1974, p. 199, fig. 8) occur on two branches of the Ryôhakus, and *K. spelaeus* is isolated at the southern end of another branch of the same mountain range. The distributional range of the species-group extends farther south to near the southern end of the Ibuki Mountains, which are continuous to the Ryôhakus through the Etsumi Mountains.

A *Kurasawatrechus* recently found in the Oshimata-dani (490 m in altitude) of Kasuga in Ibigawa-chô, which is about 28 km distant in a beeline from Shagataté-yama to the south by west beyond the Ibi-gawa Valley, well accords with *K. yadai* in external morphology including the standard ratios, all of which are contained in the individual variation of the latter species; body length 3.30 mm, PW/HW 1.39, PW/PL 1.06, PW/PA 1.31, PW/PB 1.22, PB/PA 1.08, EW/PW 1.57, EL/PL 2.44, EL/EW 1.47. However, the aedeagus is a little shorter and a little more evenly arcuate, bearing a thicker apical part and trisetose styles. Unfortunately, the single known specimen collected by Takao NAITÔ on 14 June 2005 is somewhat teneral, and its genitalia are not yet fully sclerotized. For this reason, we cannot determine its taxonomical status at the present moment. As is readily understood from the close similarity in external morphology between *K. yadai* and *K. spelaeus*, speciation of the members of the *spelaeus* group has initially taken place in reproductive organs and hardly in external characters. We should therefore be very careful in describing new species of this species-group, or of the members of the genus *Kurasawatrechus* in general, when available sample size from single populations is not adequately large.

This new species is dedicated to Mr. Hideo YADA, who first noticed the occurrence of *Kurasawatrechus* on Shagataté-yama that lies near the western periphery of the distributional range of the genus.

Trechiama (s. str.) ***gracilior*** S. UÉNO, 1980

Trechiama (s.str.) *gracilior* S. UÉNO, 1980, Bull. natn. Sci. Mus., Tokyo, (A), **6**, pp. 202, 241, figs. 46–48; type locality: Midori-dani in Neo-mura.

Shagataté-yama specimens examined. 1♂, (Tokuyama side), 14–VI–2003, M. MORI leg.; 1♂, (Tokuyama side), 17–IV–2004, K. KITAYAMA leg.; 1♀, (Neo side), 24–IV–2005, S. UÉNO leg.; 1♂, (Higashi-maé-no-tani, Higashisuibara, Fujihashi-mura), 29–IV–2004, M. MORI leg. All in NSMT.

Notes. The Shagataté-yama specimens of an upper hypogean *Trechiama* accord well with the type series of *T. gracilior* S. Uéno, originally described from the Midori-dani, about 9.5 km distant to the southeast in a beeline. Since the type locality also lies on the Ibi Hills, it is not surprizing that the same species occurs in the two places. On Shagataté-yama, it is rather rarely found from beneath gravelly deposits near streams, so that it never coexists with *Suzuka*. The specimen from the Higashi-maé-no-tani, which is located near the southern foot of Shagataté-yama, is slightly different from the other three specimens from higher stations in somewhat thicker aedeagus, but can safely be regarded as an infraspecific variant of *T. gracilior*.

As was described in the original account, the type specimens of *T. gracilior* were taken from beneath stones lying on the banks of a stream in a deciduous broadleaved forest. After the description, three specimens of the same species were found in an abandoned mine adit located in the same valley. Their collecting data are as given below:

3♂♂, Teikoku Mine, Nakamata, Midori-dani, Neo-mura (now Motosu-shi), Gifu Pref., 4–IV–1987, A. Amagasu & H. Yokozeki leg. (NSMT).

要　　約

上野俊一・北山健司：美濃地方揖斐山地のシャガタテ山にすむメクラチビゴミムシ類．——両白山地の西端部から南方へ延びる支稜（揖斐山地）の中央部に位置するシャガタテ山（徳山富士とも呼ばれる）から，3種のメクラチビゴミムシ類を記録した．そのうちの2種は，土壌に覆われた板状頁岩の間隙をおもな生息場所とする地中性のもので，いずれも新種と認められたので，モリメクラチビゴミムシ *Suzuka morii* S. Uéno et K. Kitayama およびヤダメクラチビゴミムシ *Kurasawatrechus yadai* S. Uéno et K. Kitayama の新名を与えて記載した．サメメクラチビゴミムシ属 *Suzuka* 第3の種がこの山系で発見されたことは，分類学的にも生物地理学的にも重要で，特筆するに値する．他の1種は地下浅層性で，同じ山地の約9.5 km南東方に位置する，根尾の水鳥谷から記載されたネオメクラチビゴミムシ *Trechiama gracilior* S. Uéno に同定されたので，ここに新産地として記録した．

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